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Construction - Part 2

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New Hampshire DOT Department of Transportation

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Construction - Part 2

- **Change Orders**

- Quality Assurance Program
- Final Inspection

- Traffic Control

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Change Order Definition

When work is needed that is different or in addition to the work provided for in the construction contract documents

Written agreement between the contractor and the Project Sponsor modifying the existing contract

Needs prior approval from NHDOT

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7 Types of Change Orders

- Normal / Non Critical
- Critical path
- Emergency condition
- Time extension
- Non-participating
- Balance and excess
- Final balancing

The process is generally the same for each above, the time for "Emergency Condition" and "Critical Path" CO's is less

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7 Change Orders steps

1) Identify need
2) Engineer's IGE
3) Contractor's cost estimate
4) Engineer's Justification
5) Negotiate & submit
6) Wait for NHDOT approval
7) Execute Change Order

CO Step #1 – Identify Need

Contractor, Contract Administrator (CA), Project Engineer, or Sponsor identifies need **in writing**

<u>Example</u>

Contractor needs more drainage pipe:

- Needs additional 15 feet of 15” pipe **(existing contract item)**
- Needs 24 feet of 24” pipe (**Not in contract)**

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CO Step #2 - Engineer's IGE

Justify draft change order in writing

- Description of work
- Schedule impact
- Cost implication (IGE)
- All backup to justify need

If justified, then request price from contractor (recommended to seek NHDOT's opinion at this step)

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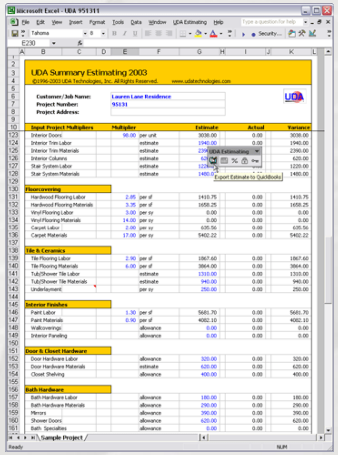
CO Step #3 – Contractor's Cost Estimate



Price items per unit price specifications

Example contractor change order price installed per foot

- $10 per foot for 15" pipe
- $20 per foot for the 24" pipe

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CO Step #4 – Engineer's Justification

Are unit prices reasonable?

- Existing Contract Item (15" pipe)

  Verify change order unit price ($10/FT) is close to existing contract unit price.

  If CO quantity is significantly more than base bid quantity? Then change order unit price should come down.

- New Contract Item (24" pipe)

  Review and document weighted average unit prices and/or other similar projects for comparison to contractors change order price.

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CO Step #5 – Negotiate & Submit

Similar to scope & fee

- Discuss any differences in scope or understanding of the proposed CO

- Negotiate among Contractor, Sponsor, Contract Administrator and Project Engineer to determine cost

- **Document and submit draft CO & IGE to NHDOT for review and approval**

CO Step #6 – Wait for Approval

NHDOT process

- Review draft CO
- Discuss with FHWA
- Request additional funds from NHDOT Program Manager and FHWA

NHDOT process can take time and no change order work can begin until NHDOT approval in writing

CO Step #7 – Execute Change Order

- All parties sign the Change Order per the contract documents

- **Copy the NHDOT on the signed executed document**

- We prefer hard copy and PDF

Emergency and Critical Path CO's

Same Process but Expedited

- **Emergency**: Imminent danger or unsafe condition
- **Critical Path**: Item will delay the project based on CPM project schedule

- **Still need NHDOT prior approval**
- See LPA Manual Section #27 for more information

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Time Extension and Non-Participating CO's

- **<u>Contract Time Extensions</u>**: Need to be documented and approved by NHDOT *Liquidated damages may come into play for additional CE time*

- **<u>Non-Par Changes</u>**: Need to be tracked by NHDOT and included in the overall project costs

Balance & Excess CO's

Change Orders Along the Way

- NHDOT requires comparing the contract item totals with the installed quantities at the 25%, 50%, 75% and 90% stages of a project

- This helps to identify the need for additional funds early and gives time to run a balance and excess change order if necessary

Final Balancing CO

Final Change Order at project completion

- Documents final pay quantities for every item constructed
- It is too late to ask for additional funds at this point in time
- **Change Orders need to be approved prior to that work beginning**

Construction - Part 2

- Change Orders
- **Quality Assurance Program**

- Final Inspection
- Traffic Control

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Quality Assurance Program

Basics:

- **Acceptance Testing:**
  Done by Construction Engineer
- **Independent Assurance Testing**:
  Done by NHDOT Bureau of M&R

- Both shall follow QAP document titled:
  "*NHDOT Quality Assurance Program for Municipally Managed Federal-Aid Projects*"

Found in Appendix #21 and handouts

Quality Assurance Program

Construction Engineer

- Fills out *Quality Assurance Program Information Form* (**see handout**) based on items in contract (concrete, asphalt, etc…)

- Submits form to NHDOT Bureau of M&R at beginning of construction phase

- Follows testing guidance in document

QAP Quality Assurance Program

Frequency of testing example

Material	Property	Test	Acceptance test by CE	Assurance test by NHDOT
304.1 Sand	Compaction	AASHTO T191, T310, or Test Strip	In Place 1/1,200 CY	One CE Test with NHDOT present (within last calendar year)

Assurance Testing is mostly "testing the tester"

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Quality Assurance Program

Certifications for Testers

- **Soil and Asphalt Testers** need Certification from **NETTCP** (North East Transportation Training & Certification Program)

- **Concrete Testers** need Certification from **NETTCP** or **ACI** (American Concrete Institute)

QAP Quality Assurance Program

Project records

- A **"Lab Book"** shall be part of project records that has documentation of tests performed and test results
- The CE must certify at the end of the project that materials incorporated into the work were in conformance with plans and specifications

See handout for sample Certification Form

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QAP Quality Assurance Program

Qualified Products List

Some items are prequalified for quality:

Example:
Item #559 - Asphaltic Plug Expansion Joint
559.2.1 – "The expansion joint shall be one of the products listed on the Qualified Products List"

www.nh.gov/dot/org/projectdevelopment/materials/research/products.htm

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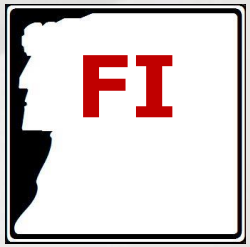
Construction - Part 2

- Change Orders
- Quality Assurance Program
- Final Inspection



- Traffic Control

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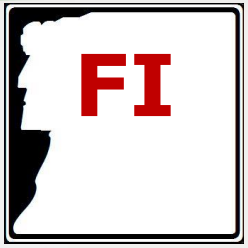
Final Inspection

Who to Invite?

- Sponsor, CE, Contract Administrator, Contractor, NHDOT Project Manager and FHWA

- Also, NHDOT Highway Maintenance if NHDOT will have maintenance responsibility



Final Inspection

Punch List … then Complete & Accept letter

- Inspect project for flaws, incomplete work and needed changes
- Contract Administrator generates **Punch List**
- Once Punch List is satisfactorily completed, Sponsor issues **Complete and Accepted letter** with **date** the project was turned over to the Project Sponsor and maintenance begins

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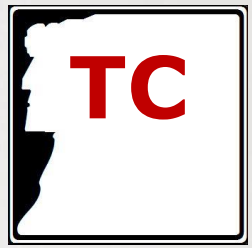
Construction - Part 2

- Change Orders
- Quality Assurance Program
- Final Inspection
- **Traffic Control**



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Why Work Zone Traffic Control ?

SECTION #23

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Traffic Control

Work zones create unexpected conditions for the travelling public which can harm construction workers, cause traffic crashes, injuries and/or fatalities

W21-1a

SECTION #23

New Hampshire DOT Department of Transportation

Goals for Work Zone Traffic Control

W20-1

- Protect construction workers
- Protect the travelling public
- Provide acceptable levels of traffic capacity for the travelling public
- Maintain access to abutters
- Provide flexibility based on work zone operations
- Follow **Manual of Uniform Traffic Control Devices (MUTCD)**

Work Zone Considerations

2 Questions to ask:

- What are you doing?

"the construction operation"

- Where are you doing it?

"the transportation setting"

W20-7a

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Work Zone Considerations

Operational Considerations:

- Width and length of work zone
- Duration of work
- Time of work (night vs. day)
- Rolling operation or stationary
- Type of construction equipment
- Where will the drainage go?

W20-7a

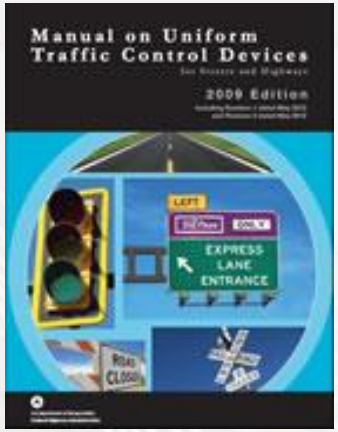
Work Zone Considerations

Setting Considerations:

- Type or class of roadway
- Traffic volumes
- Roadway geometry / sight lines
- Speed of traffic
- Other Traffic: Pedestrians / Bikes / Trains / Boats / Airports / Railroads?
- Business access
- Other nearby work zones

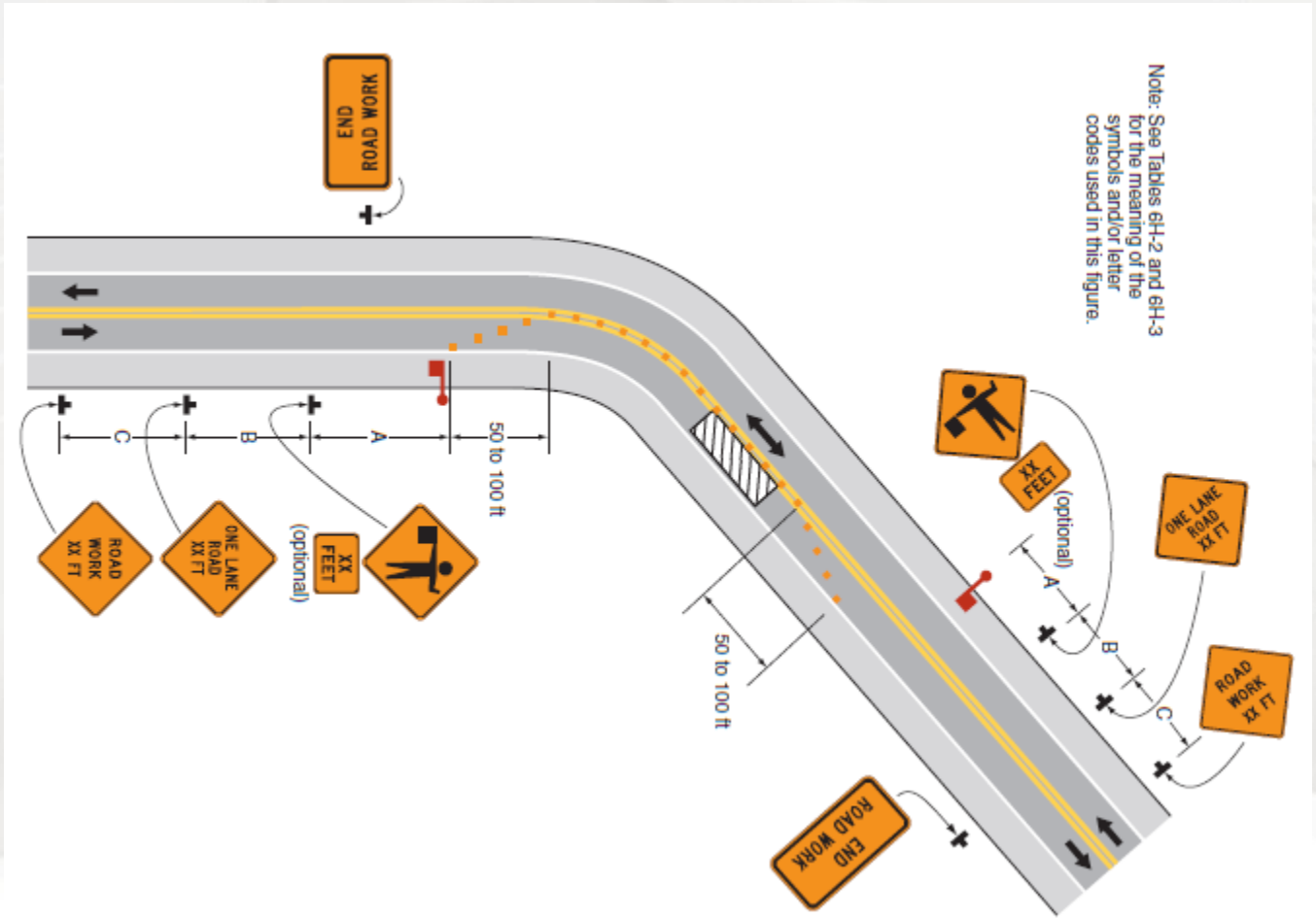
Work Zone Traffic Control Plan

- A project specific **Traffic Control Plan (TCP)** shall be developed as part of the design process



- The **TCP** shall be based on standard sequences of signs or other traffic control devices as shown in **NHDOT Highway Design Manual** & **MUTCD Part 6 - Temporary Traffic Control**

Work Zone Traffic Control Plan



Alternating one way traffic with flaggers

MUTCD Figure 6H-10

SECTION #23

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Traffic Control Inspection

During construction the Contract Administrator should make frequent reviews of actual traffic control installations

W20-7a

SECTION #23

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Work Zone Traffic Control

DO's

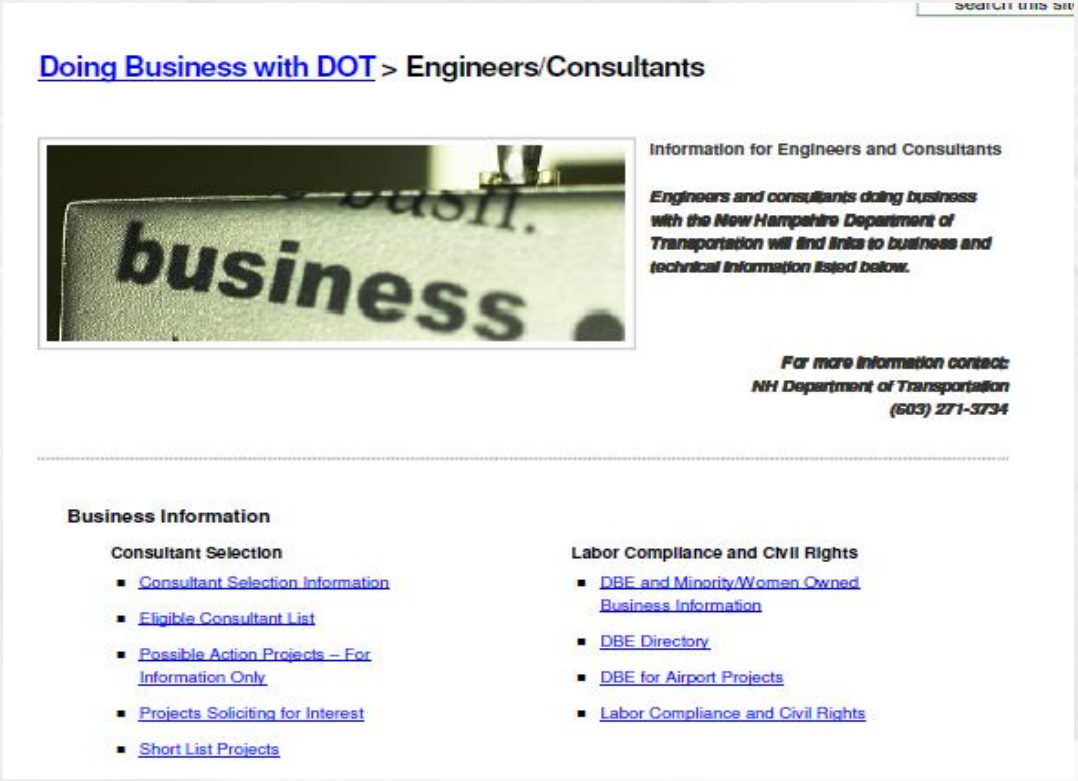
- Clean signs
- High reflectivity
- Good condition
- Fresh temporary pavement markings

DONT's

- Dirty / broken signs
- Missing reflectivity
- Spray paint on plywood
- Duct tape on signs
- Faded temporary pavement markings

Traffic Control Web Links

Doing business section



Scroll to bottom right, Work Zone Safety

http://www.nh.gov/dot/business/engineers.htm

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Important Traffic Control Links

NHDOT Website Links

1) Law Enforcement Training requirement

2) Law Enforcement & Flagger Policy

3) Work Zone Safety and Mobility Policy
   - Traffic Control Committee
   - Work Zone Crash Report requirement

Link #1 - Law Enforcement Training Requirement

Correct Paddles

See handout for training info

SECTION #23

New Hampshire DOT Department of Transportation

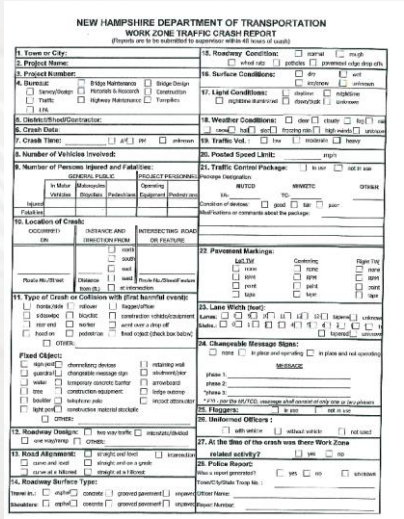
Link #2 - NHDOT Flagger and Law Enforcement Policy

- Provides guidance for use of flaggers and uniformed officers
- Purpose is to maintain the highest level of safety and reduce costs
- LPA shall follow policy

See handout for copy of policy

Link #3 -Work Zone Crash Reporting

- Work zone crashes shall be reported to the NHDOT by the Sponsor and/or Consultant
- Use **Work Zone Crash Report** (WZCR)
- Submit completed WZCR's to your Project Manager (hard copy or scanned email)



NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CRASH REPORT

See handout for sample WZCR

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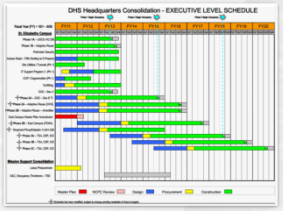
Const 1

Construction - Part 1

Re-Cap



- Preconstruction Meeting
- Contractors CPM Schedule
- Oversight & Inspection

- Project Records
- Construction Reimbursement

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Construction - Part 2

Re-Cap

- **Change Orders**

- Quality Assurance Program
- Final Inspection

- Traffic Control

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Questions?

Next Up: Project Ending